To: Bryan Foote, P.E.

From: Jayson Cluff, P.E.

Date: March 23, 2005

Subject: Snake River Avenue Traffic Analysis Technical Memorandum

HORROCKS ENGINEERS

MEMORANDUM

Introduction

The purpose of this technical memorandum is to describe the procedures and results of the traffic analysis study for the Snake River Avenue Environmental Assessment in Lewiston, Idaho. This memo will describe the study intersections, summarize the data collection, define future traffic projections, summarize traffic operations analysis, and describe recommended improvements.

Study Intersections

Snake River Avenue and Bryden Canyon Road

Bryden Canyon Road is grade separated at the Snake River Avenue. Its bridge structure continues west over the Snake River to Clarkston. Three intersections serve the various traffic movements between Snake River Avenue and Bryden Canyon Road as shown in Figure TM-1.

Figure TM-1: Snake River Avenue and Bryden Canyon Road

The Snake River Avenue and Bryden Canyon Road full access intersection allows all traffic movements. It is used primarily by eastbound (EB) Bryden Canyon Road traffic to access Snake River Avenue via the loop ramp, by northbound (NB) Snake River Avenue traffic to access Bryden Canyon Road, and by southbound (SB) Snake River Avenue traffic to access EB Bryden Canyon Road. This intersection functions as a "T" intersection with the westbound (WB) right-turn as yield controlled, WB left-turn as stop controlled, and NB and SB traffic uncontrolled.

The WB Bryden Canyon Road Off-Ramp is a one-way street that intersects with Snake River Avenue. It serves only the WB Bryden Canyon Road traffic for access to Snake River Avenue. The intersection is a "T" intersection with the WB movements stop controlled and the NB and SB traffic uncontrolled.

The SB Snake River Avenue Off-Ramp serves only the SB Snake River Avenue to WB Bryden Canyon Road movement. It functions as an uncontrolled ramp diverge intersection.

Snake River Avenue and Southway

The intersection of Snake River Avenue and Southway is one of two signalized intersections studied in this report. It is a "T" intersection with a NB bypass lane. The SB leg provides separate left-turn and thru traffic lanes. The WB leg also provides separate left-and right-turn lanes. One issue at this intersection is the close proximity of Prospect Avenue which intersects Southway approximately 100 ft east of Snake River Avenue. For Southway, which is a minor arterial, a minimum 350 ft street spacing is recommended. Figure TM-2 shows the intersection from a view looking south.

Figure TM-2: Snake River Avenue and Southway, looking south.

Snake River Avenue and 11th Avenue

The intersection of Snake River Avenue and 11th Avenue is another "T" intersection. No separate turn lanes are provided, so all turn movements are shared with the thru movements. The 11th Avenue leg is stop controlled and the Snake River Avenue legs are uncontrolled. 11th Avenue has a steep grade as shown in Figure TM-3.

Figure TM-3: Snake River Avenue and 11th Avenue, looking east.

Snake River Avenue and US-12 Bypass

US-12 provides the second connection between Clarkston and Lewiston via a bridge structure over the Snake River. The northernmost study intersection is a "T" intersection of Snake River Avenue and the US-12 Bypass that goes under the US-12 structure as shown in Figure TM-4. All turn movements are separated from the thru movements. The US-12 Bypass leg is stop controlled and the Snake River Avenue legs are free moving.

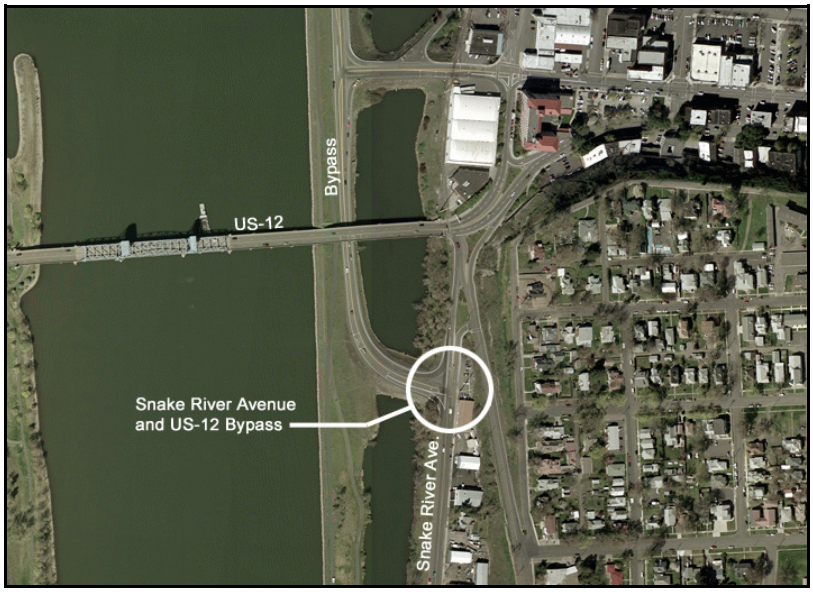

Figure TM-4: Snake River Avenue and US-12 Bypass

Southway and 8th Street

The Southway and 8th Street intersection is the second signalized intersection studied in this report. Each leg of the intersection has an exclusive left-turn lane, one exclusive thru lane, and a shared thru/right-turn lane. Figure TM-5 shows the intersection from a view looking east.

Figure TM-5: Southway and 8th Street, looking east.

Data Collection

Turning movement traffic counts for the study intersections were performed by L2 Data Collection between December 14 and December 16, 2004. Existing lane geometries and intersection controls were also recorded by L2 Data Collection. Details of the counts are attached to this memo.

A previous study of Snake River Avenue was also used as a resource. The report was titled "Snake River Avenue Concept Plan, City of Lewiston, Idaho, Level of Service Summary - Draft" and was prepared by John R. Watson, P.E. in 2002.

2030 Traffic Projections

Traffic volumes were projected based on existing population growth and existing traffic growth. The 1990 census showed Lewiston with a population of 28,082. The 2000 census showed the population increased to 30,904. This represents a 1 percent growth rate compounded yearly over the ten year period. Traffic normally grows at a faster rate than population. The Level of Service Summary report mentioned above used a 2 percent growth rate for future traffic volume projections. Based on the fact that much of Lewiston in the vicinity of the study area is built-out and is not expected to experience heavy future growth, a 2 percent traffic growth rate is a reasonable and conservative rate to use for this report also. Table 1 shows a comparison of the Snake River Avenue Concept Plan's 2004 projected ADT's (Average Daily Traffic) with the actual 2004 traffic count ADT's collected as part of this study.

Table 1: 2004 ADT Comparison – Projected vs. Actual

Road Segment	SRA Concept Plan 2004 ADT Projections Using 2 Percent Growth*	Actual 2004 ADT Traffic Volumes**
Southway	9,994	10,200
Snake River Avenue North of Southway	8,510	8,800
Snake River Avenue South of Southway	13,572	13,000

*Source: Snake River Avenue Concept Plan, City of Lewiston, Idaho, Level of Service Summary - Draft.
** Source: L2 Data Collection, December 14-16, 2004.

A comparison of the projected ADT values to the actual ADT values shows a reasonable agreement between the two. Therefore, a continued use of the 2 percent growth rate is reasonable to project future traffic volumes. Figure TM-6 shows the projected 2030 traffic volumes used for this report based on the 2 percent growth rate.

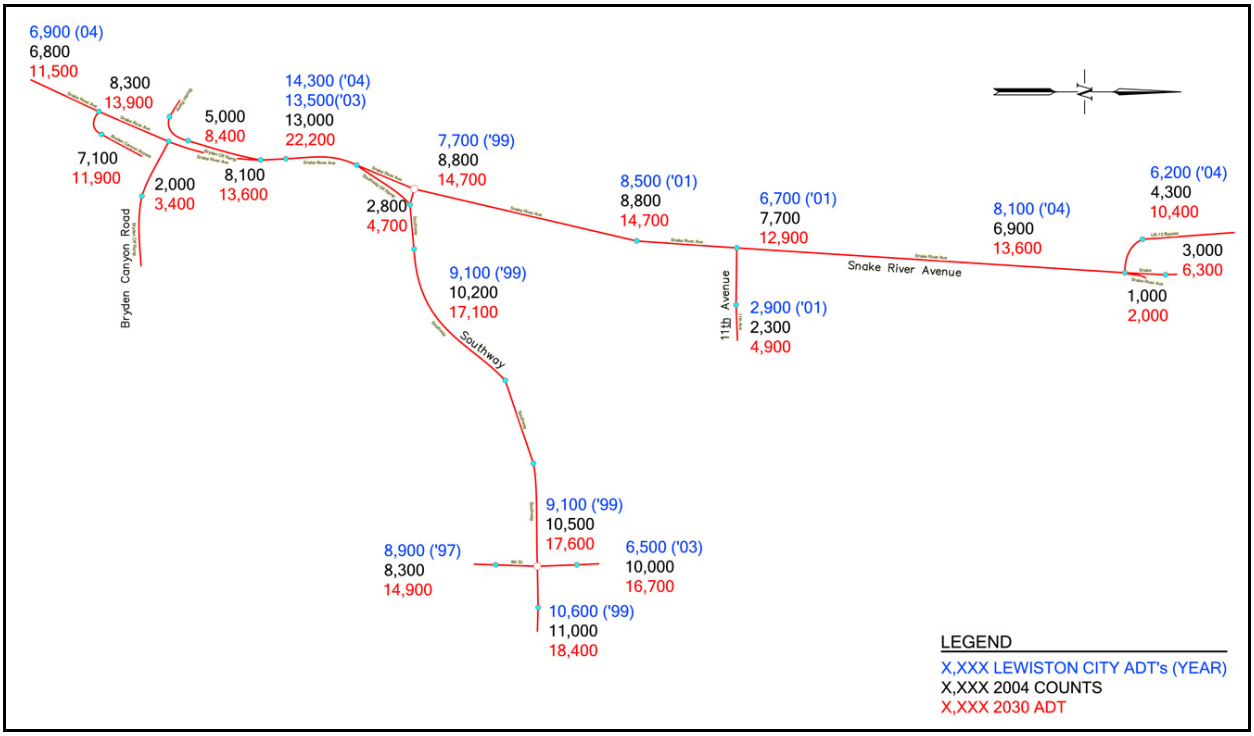

Figure TM-6: Existing and 2030 ADT Volumes.

Intersection Traffic Operations Analysis

Level of Service (LOS) is a term used by the *Highway Capacity Manual* (HCM) to describe the traffic operations of an intersection, based on congestion and delay. It ranges from LOS A (almost no congestion or delay) to LOS F (traffic demand is above capacity and the intersection experiences long queues and excessive delay). LOS C is generally considered acceptable for rural intersections. LOS D is acceptable for urbanized intersections. LOS E is the threshold when the intersection reaches capacity. For two-way stop controlled intersections, average intersection-wide delay and LOS are not defined by the HCM. Therefore, for these intersections only the minor street approach with the highest delay will be reported.

For this report, the intersection LOS's were calculated using the Synchro and SimTraffic (version 6) software package. Traffic simulation provides better analysis between adjacent intersections because it accounts for the effect of gaps created by nearby signalized intersections on the traffic operations of the un-signalized intersections. The following table summarizes the existing (2004) and 2030 LOS's for the study intersections.

Table 2: Existing and 2030 Traffic Operations Analysis Summary

Intersection	PM Peak Hour			
	Existing Conditions (2004)		2030 Conditions (No Build)	
	Delay	LOS	Delay	LOS
Snake River Ave. and Bryden Canyon Full Access*	4.8	A	18.0	C
Snake River Avenue and WB Bryden Off-Ramp*	7.6	A	26.7	D
Snake River Avenue and Southway	21.1	C	111.6	F
Off-Ramp Terminus and Southway*	5.4	A	9.6	A
Southway and 8th Street	19.1	B	44.8	D
Snake River Avenue and 11th Avenue*	10.3	B	138.9	F
Snake River Avenue and US-12 Bypass*	11.1	B	16.5	C
*Unsignalized intersection, the approach with the highest delay is reported.				

As shown in Table 2, under the existing (2004) conditions, all study intersections operate at LOS C or better. With no improvements to the study intersections, delays will increase significantly by 2030. The Snake River Avenue/Southway and the Snake River Avenue/11th Avenue intersections are both expected to operate at LOS F. The Snake River Avenue/WB Bryden Off-Ramp and Southway/8th Street intersections are both expected to operate at LOS D. The remaining study intersections are expected to operate at LOS C or better in 2030.

Roadway Capacity Analysis

Snake River Avenue and Southway are two-lane highways classified by Lewiston City's transportation system as minor arterials. The maximum ADT volume of a two-lane arterial at LOS D ranges between 11,500 and 15,500 vehicles per day (vpd). The maximum ADT volume will depend on the number and frequency of access points along the corridor. From Figure TM-6 shown above, the 2030 ADT of Southway will be over 17,000 vpd and the ADT of Snake River Avenue south of Southway will be over 22,000 vpd. Both of these values exceed the LOS D volume threshold of a two-lane arterial. The ADT of Snake River Avenue north of Southway

will be 14,700 vpd which is approaching the upper limit of the LOS D volume threshold. Based on these projected ADT values, Snake River Avenue and Southway will require capacity improvements to maintain LOS D operations in 2030.

Recommended Intersection Improvements

In order for the study intersections to operate at LOS D or better in 2030, several intersection improvements are recommended. Each intersection will be discussed separately.

Snake River Avenue and Bryden Canyon Road

No improvements required.

Snake River Avenue and Southway

- Add protected-permitted signal phasing for SB left-turn movement.
- Add dual WB left turn lanes.
- Widen Snake River Avenue to two SB thru lanes between Southway and Bryden Canyon Road.
- Either cul-de-sac Prospect Avenue, or add a raised median on Southway to restrict Prospect Avenue to be right-in/right-out only.

Snake River Avenue and 11th Avenue

- Add SB left-turn lane, NB right-turn lane, and WB right-turn lane.
- Signalize the intersection. Based on the *Manual of Uniform Traffic Control Devices* (MUTCD) signal warrant criteria, a signal will be warranted by 2030.

Snake River Avenue and US-12 Bypass

No improvements required.

Southway and 8th Street

- Optional Improvement: Add separate right-turn lanes on all legs.
- Optional Improvement: Provide protected-permitted left-turn signal phasing on all legs.

The 2030 traffic operations were analyzed with the above recommended improvements installed. Table 3 shows the results of this analysis. For convenience, Table 3 also includes the No-Build conditions shown in Table 2.

Table 3: 2030 Traffic Operations Analysis Summary – With Improvements

Intersection	PM Peak Hour					
	2030 Conditions (No Build)		2030 Conditions (With Improvements)		2030 Conditions (Additional Improvements at South Way/8th St.)	
	Delay	LOS	Delay	LOS	Delay	LOS
Snake River Ave. and Bryden Canyon Full Access*	18.0	C	21.8	C	20.1	C
Snake River Avenue and WB Bryden Off-Ramp*	26.7	D	22.5	C	20.8	C
Snake River Avenue and Southway	111.6	F	16.5	B	16.3	B
Off-Ramp Terminus and Southway*	9.6	A	9.4	A	9.9	A
Southway and 8th Street	44.8	D	38.3	D	22.6	C
Snake River Avenue and 11th Avenue**	138.9	F	17.6	B	16.6	B
Snake River Avenue and US-12 Bypass*	16.5	C	17.7	C	18.3	C

*Unsignalized intersection, the approach with the highest delay is reported.

**Unsignalized intersection under the No Build scenario; signalized under improved scenarios.

The recommended improvements improve traffic operations significantly. With all improvements, including the Southway and 8th Street improvements, all study intersections are expected to operate at LOS C or better in 2030. If the Southway and 8th Street intersection is not improved, it will operate at LOS D.

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cc: file
attachments: "Traffic Data Collection" report by L2 Data Collection
SimTraffic output data sheets